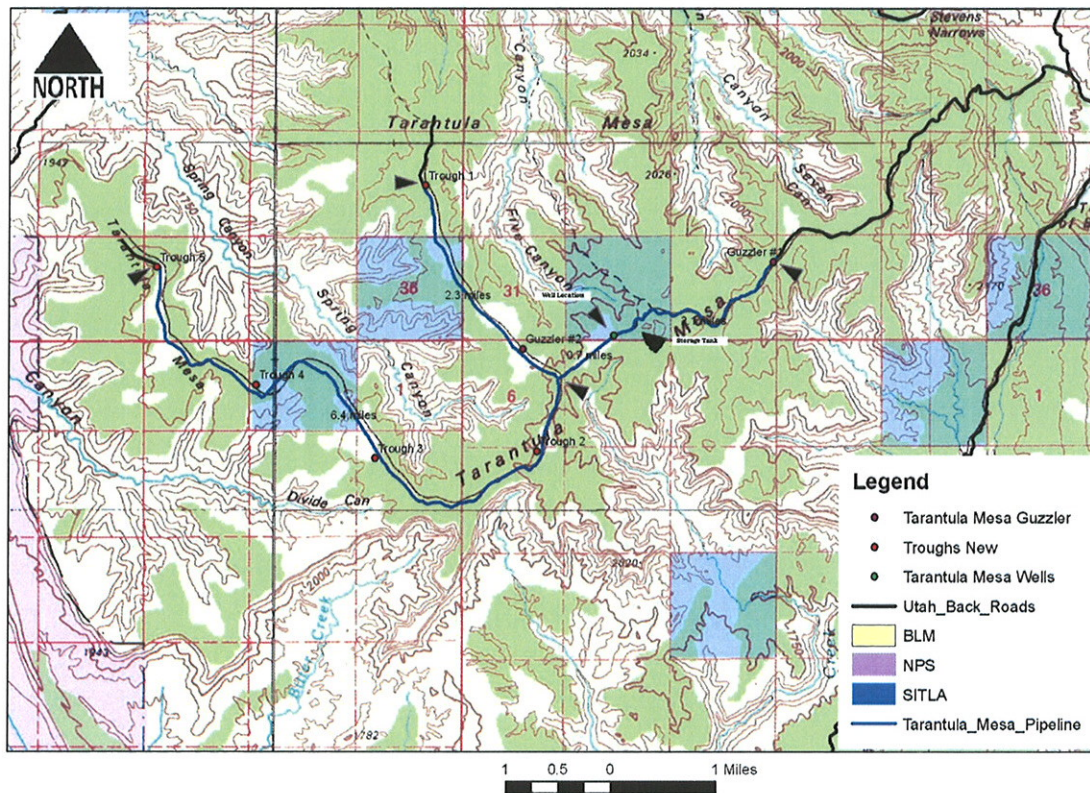


TARANTULA MESA

PIPELINE PROJECT



for

STATE OF UTAH
DIVISION OF WILDLIFE RESOURCES

June 2010

Prepared by:

Terry L. Monroe, P.E.

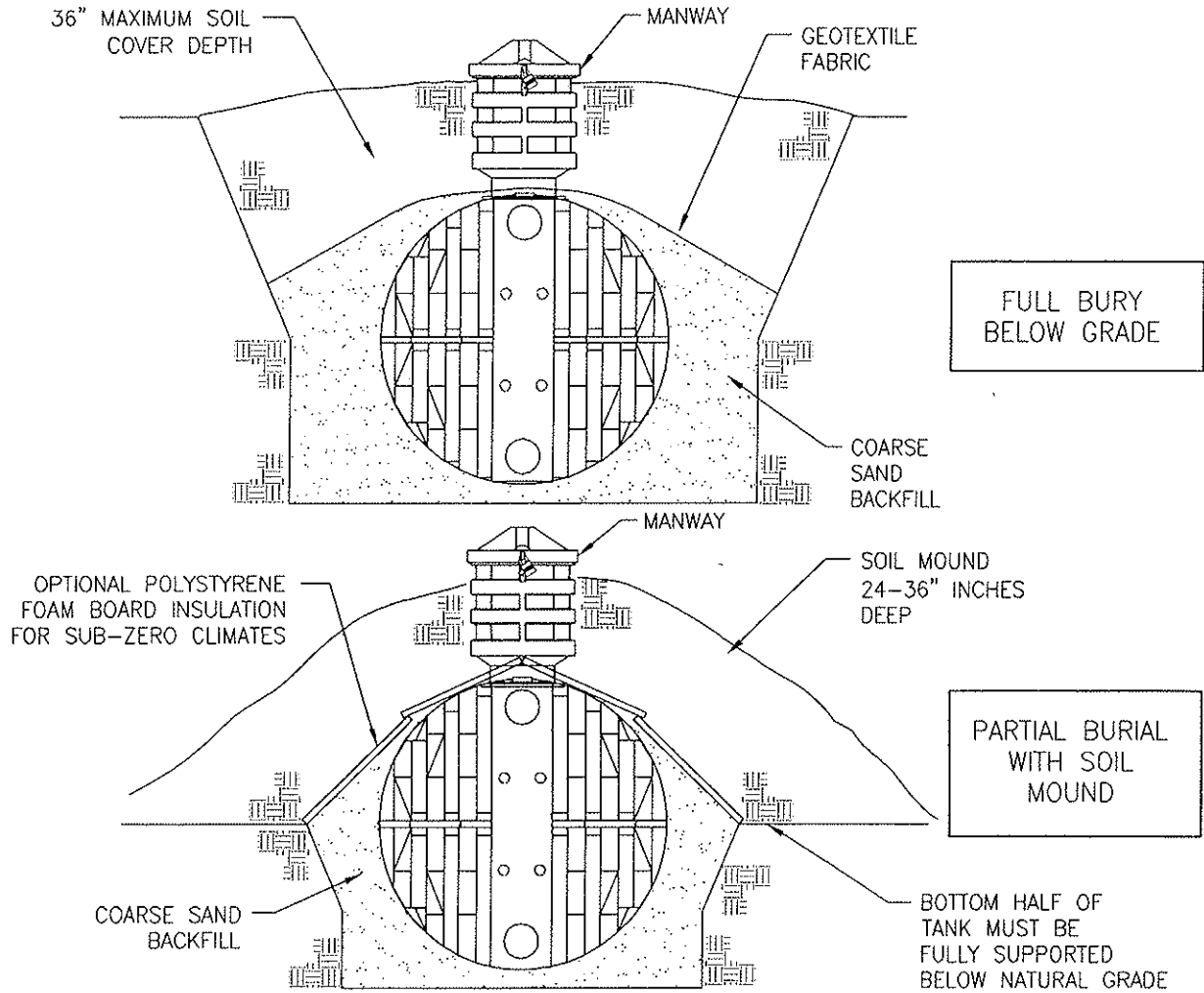
SPECIFICATIONS

- Pipe shall be HDPE SDR 11 pipe. All joints and fittings shall be welded per manufacturer specifications. The pipe shall be ripped into place to a minimum depth of 30 inches.
- The pipeline route shall be within 50 feet of the existing road way.
- The entire water system shall be operated as a closed floated system. Installation shall be in a frost free manner.
- The existing pump shall be removed and replaced with a Grundfos 6 SQF-3 pump or equivalent.
- 200 watts of additional solar panels with support structure shall be installed and wired into existing solar panel array.
- Buried frost free troughs shall be shop constructed as shown on drawings. Existing tanks or vessels can and are encouraged to be used to construct the troughs. Troughs shall be constructed, plumbed and installed in a workman like manner as shown on the drawings.
- All buried tanks shall be Darco poly tanks or equivalent capable of being fully buried or partially buried with soil mounded over. Tanks shall include top and bottom plumbing access on both ends. Vented lids shall be provided. Over flow piping shall be installed as described in the drawings. Installation shall be as specified by tank manufacturer.
- All control valve, air valves and air/vacuum valve shall be installed as shown on the drawings and open to the atmosphere.
- All control valves shall be installed as shown on the drawings
- All work shall be done in a workman type manner.

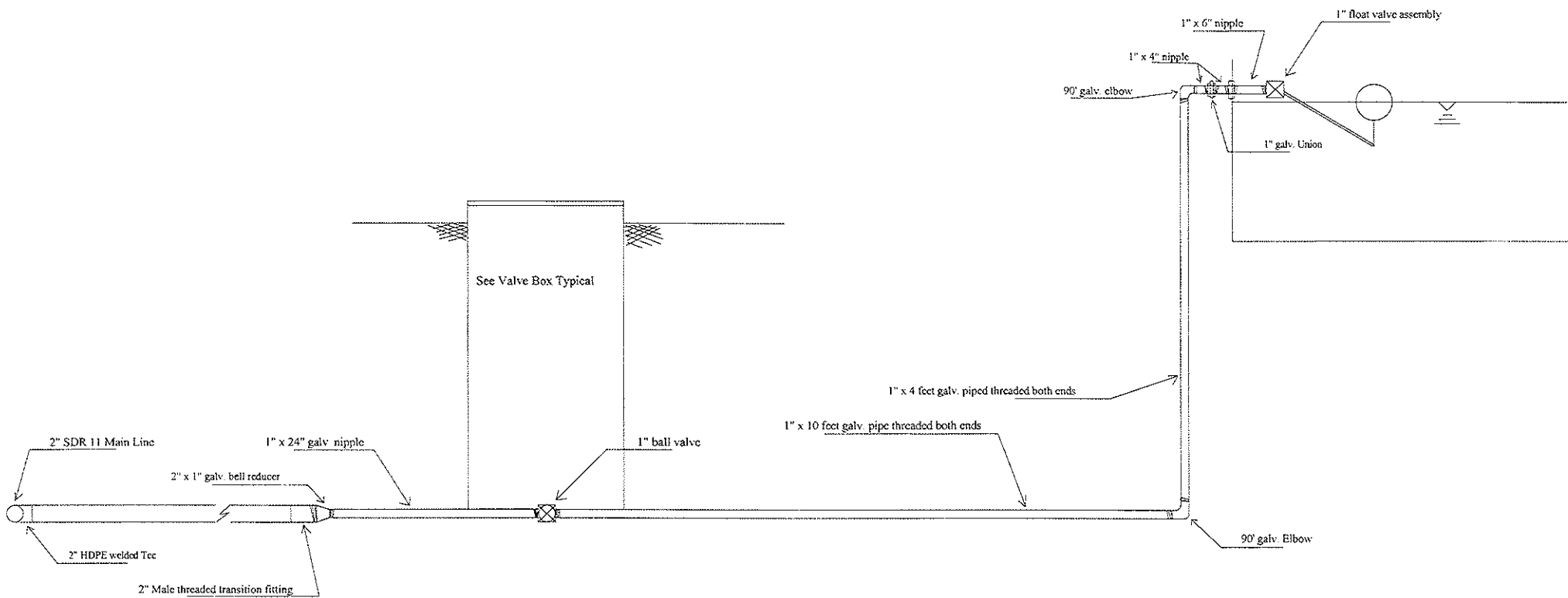
Tarantula Mesa Pipeline Project			
List of Materials			
Item description	amount required	cost per unit	total
Buried 5000 gallon storage with 2" npt opening at top and bottom of both ends and vented lid. Can be one tank or two smaller tanks	1		
Buried 2500 gallon storage tank with 2" npt opening at top and bottom of both ends and vented lid.	1		
Replace existing pump with Grunfos 6 SQF-3 pump	1		
Add additional 200 watts of solar panals with mounting frame and wiring	1		
2 inch diameter SDR 11 pipe	52500 LF		
Buried Frost Free watering trough. Shop built	7		
HDPE FITTINGS			
2" male threaded transition fitting	45		
2" 90' elbows	4		
2"x2"x2' tee	33		
GALVANIZED FITTINGS AND PIPE			
2" x 6" nipple	1		
2" x 4" nipple	6		
2" x 1" bell reducer	10		
1" x 24' nipple	7		
1" x 6" nipple	9		
1" x 4" nipple	18		
1" x 4 feet threaded pipe	7		
1" x 10 feet threaded pipe	7		
1" 90' elbow	14		
2" Union	6		
1" Union	11		
VALVES			
1" Float Valve assemblies	10		
2" Ball valve	4		
1" ball valve	9		
2 " Air / Vaccuum valve	12		
2" Air valve	10		
18 " x 36" meter barrel with iron lid	13		
6" x 36" PVC Pipe to be used for air/vac valve risers	22		
1" threaded tank fitting with stainless steel bolts to provide for float on existing poly tanks	2		
Miscellaneous piping and fittings as required to connect to existing system whre needed			

Taranula Mesa Pipeline feature locations			
ITEM	NAD 83		Northing
	Easting		
Storage Tank 5000 gallon (subject to arch)	505242		4202882
Buried Storage tank 2500 gallon	501392		4201278
Existing 10000 gal. storage and Trough	503658		4202649
Well	505087		4202872
Well existing poly tank and trough	505081		4202877
North line Buried frost free trough	502271		4205012
Buried frost free trough	503928		4201109
Buried frost free trough	501470		4200995
Buried frost free trough	499619		4202045
Buried frost free trough	498160		4203791
2" ball valve			
storage tank location	505240		420870
branch in main line North	504253		4202219
branch in main line West	504262		4202092
2500 gallon storage location	501392		4201278
Air / Vacuum valve assembly			
storage tank location	505240		420870
branch in main line North	504253		4202219
branch in main line West	504262		4202092
2500 gallon storage location	501392		4201278
valve north line	502687		4203706
valve	503907		4200885
valve	502779		4200313
valve	500151		4202369
valve	498605		4202472
valve	498308		4202766
Air valve assembly			
Valve	504439		4202339
Valve	502842		4203525
Valve	502363		4204478
Valve	503123		4200517
Valve	501710		4200787
Valve	500577		4202352
Valve	499935		4202163
Valve	499003		4202433
Valve	498147		4203457

Full Burial - Mounded Burial - Above Ground Installation

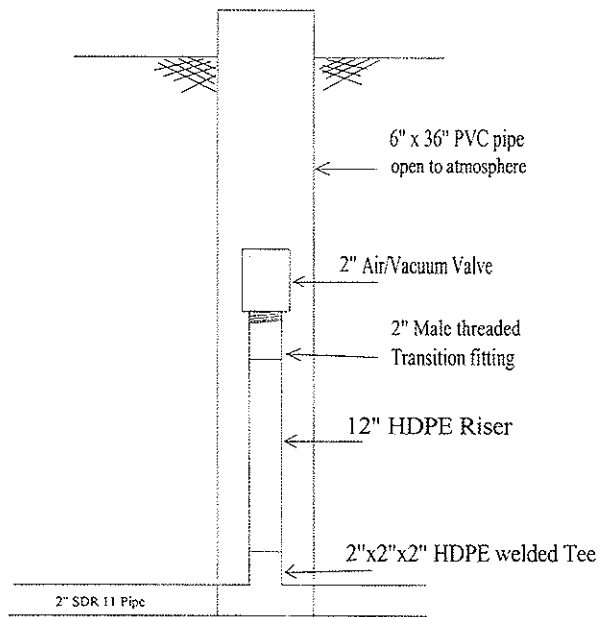


TARANTULA MESA PIPELINE TYPICAL TANK INSTALLATION	Engineer	SCALE	Sheet No: Typical 1
	T.M		
	Checked By:	Proj:	
	T.M	Tarantula Mesa	
	Drawn By	Date	
	T.M	7/13/2010	



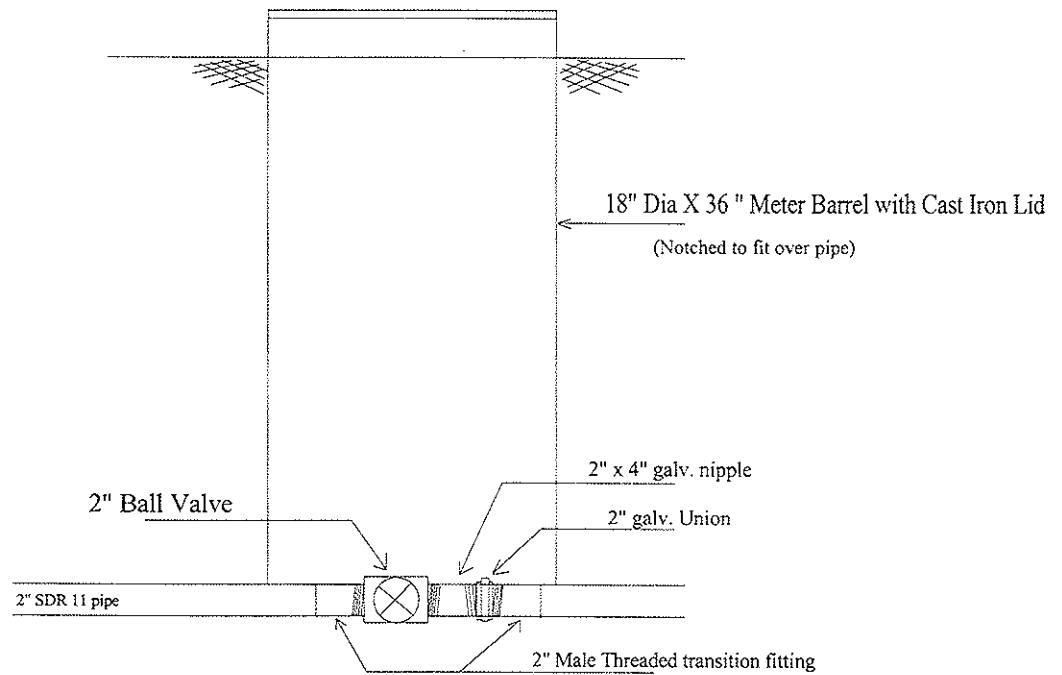
TARANTULA MESA PIPELINE TYPICAL TROUGH CONNECTION	Engineer T.M	SCALE	Sheet No: Typical 2
	Checked By: T.M	Proj: Tarantula Mesa	
	Drawn By T.M	Date 7/13/2010	

Air Vacuum Release Valve
Typical



Scale 1inch = 1 foot

Control Valve and Box
Typical



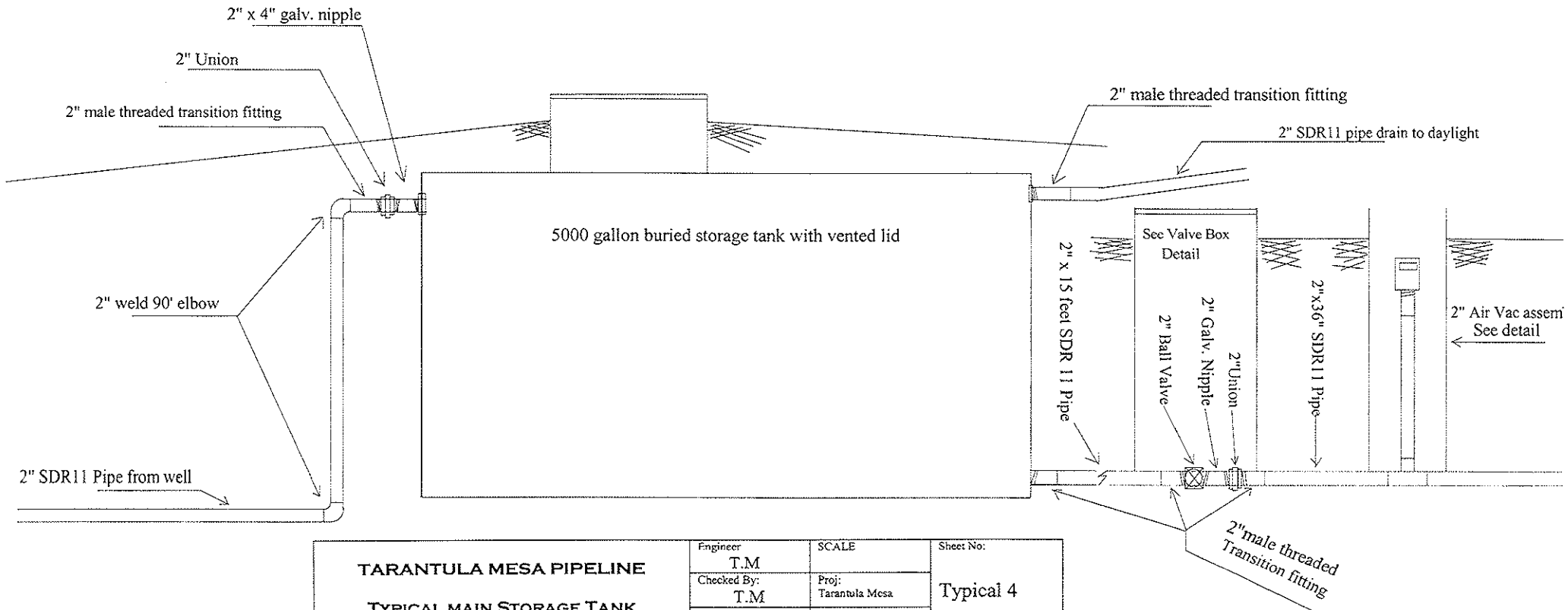
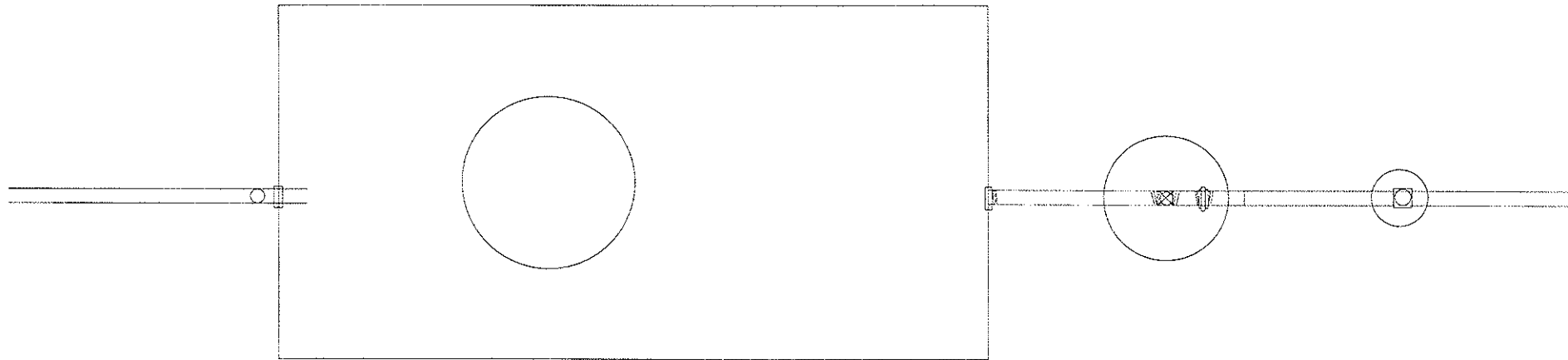
Scale 1" = 1 foot

TARANTULA MESA PIPELINE
TYPICAL VALVE BOXES

Engineer T.M	SCALE	Sheet No: Typical 3
Checked By: T.M	Proj: Tarantula Mesa	
Drawn By T.M	Date 7/13/2010	

Storage tank detail

Not to scale

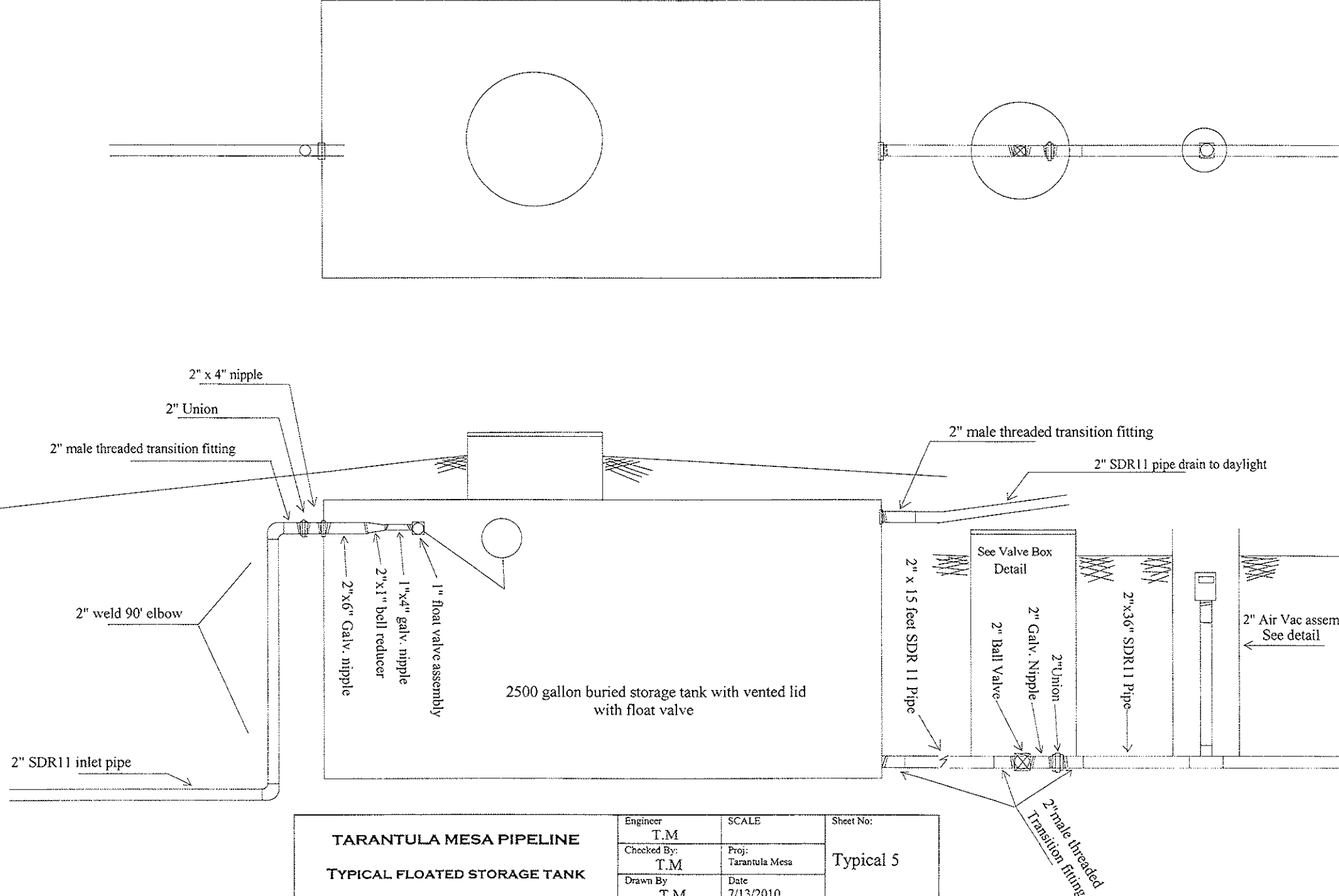


TARANTULA MESA PIPELINE
TYPICAL MAIN STORAGE TANK

Engineer T.M	SCALE
Checked By: T.M	Proj: Tarantula Mesa
Drawn By T.M	Date 7/13/2010

Sheet No:
Typical 4

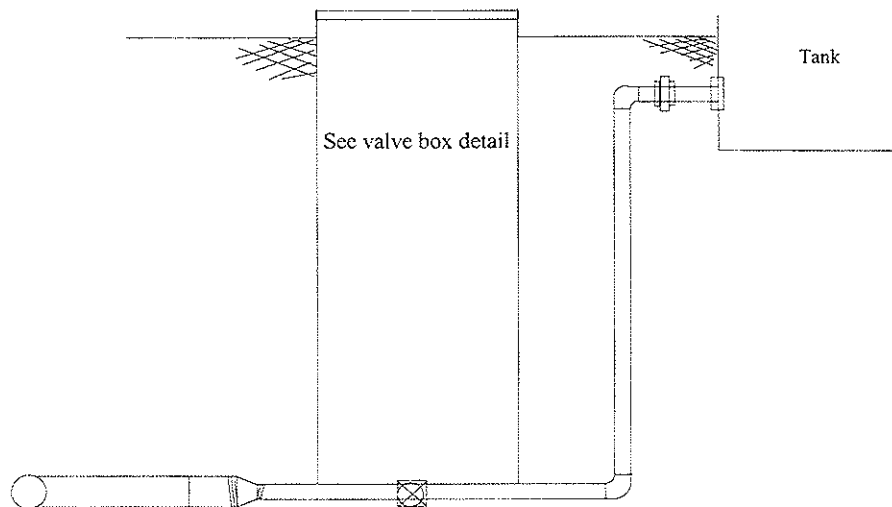
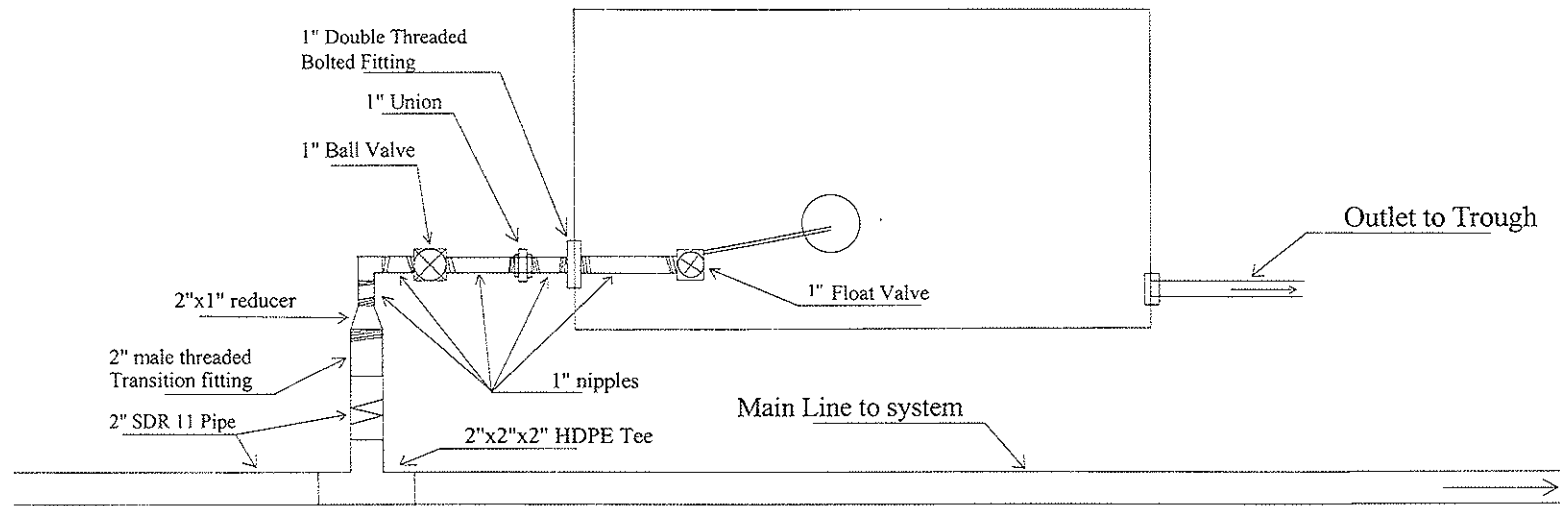
Floated 2500 gallon storage tank detail
Not to scale



TARANTULA MESA PIPELINE TYPICAL FLOATED STORAGE TANK	Engineer	SCALE	Sheet No:
	T.M		Typical 5
	Checked By:	Proj:	
	T.M	Tarantula Mesa	
	Drawn By	Date	
	T.M	7/13/2010	

Modifications to existing poly tank site
adding a float valve to tank

Existing Poly Tank

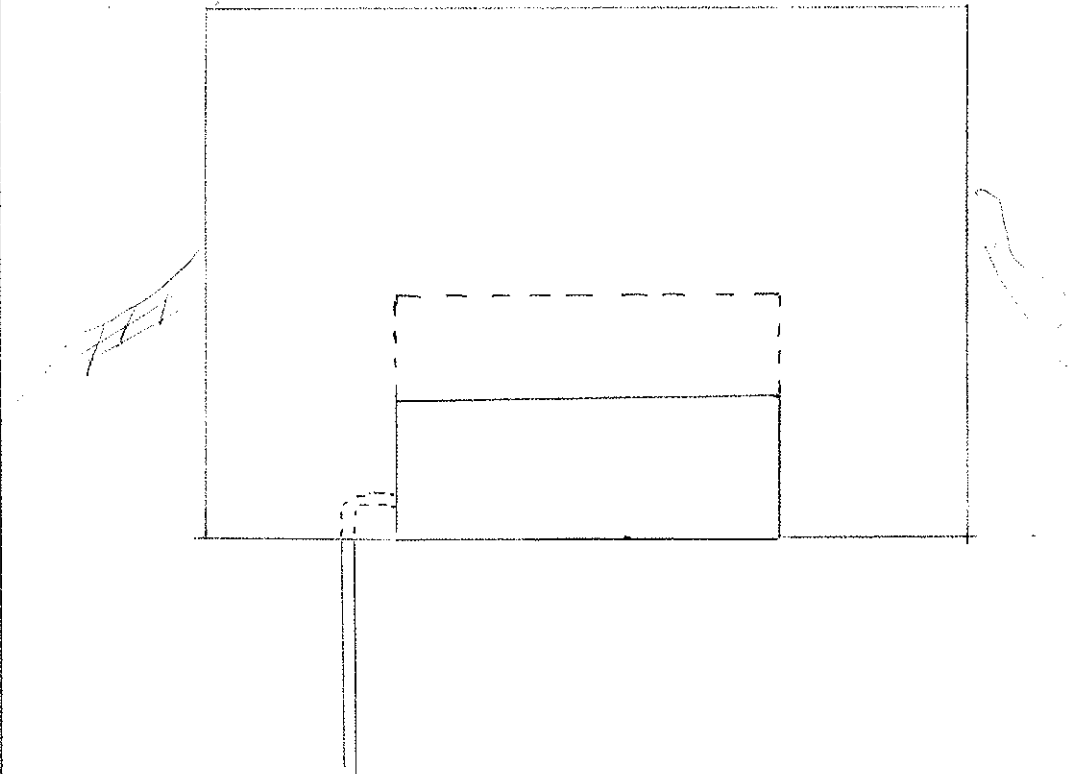
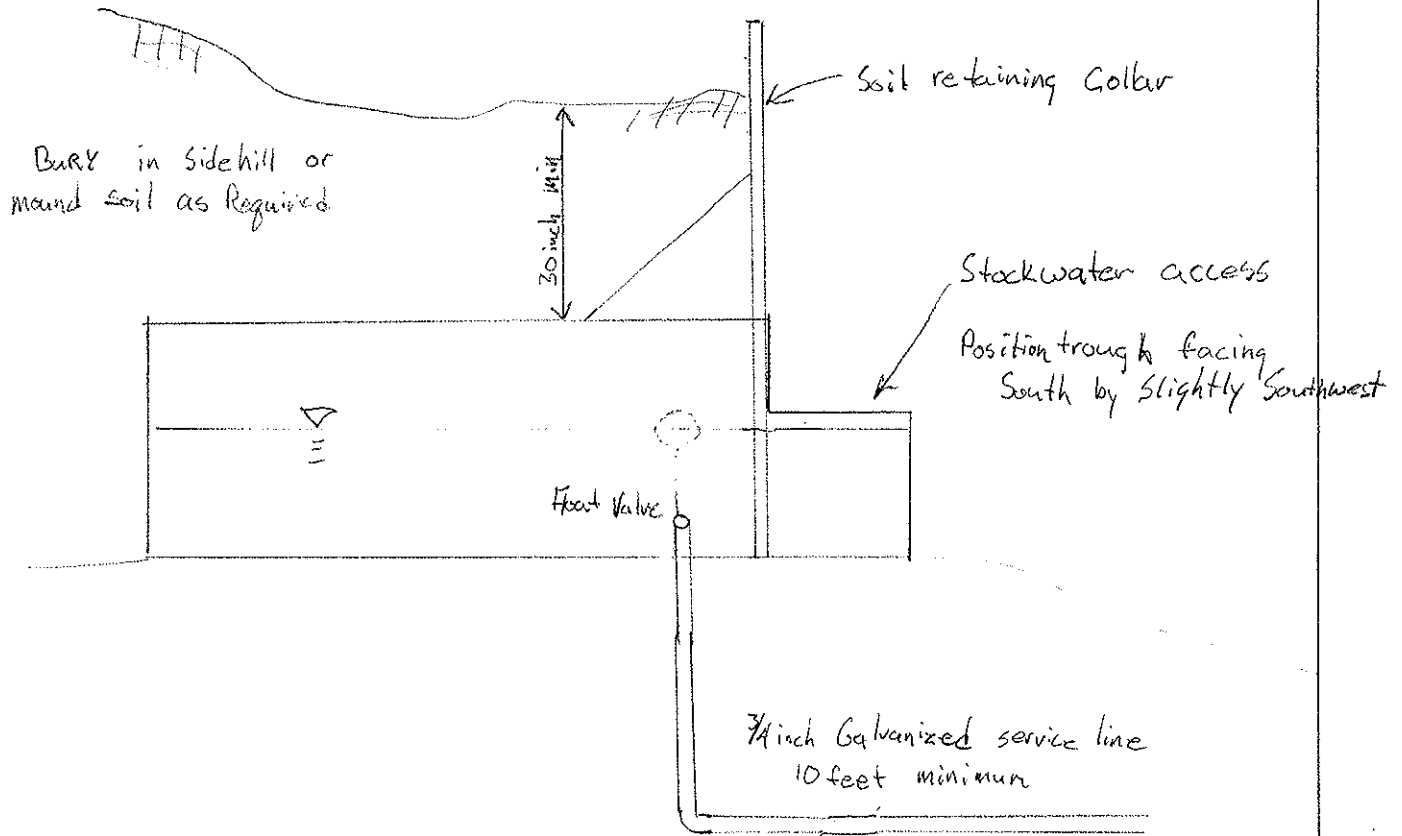


Not to Scale

TARANTULA MESA PIPELINE EXISTING POLY TANK CONNECTION DETAIL

Engineer T.M	SCALE	Sheet No: Typical 6
Checked By: T.M	Proj: Tarantula Mesa	
Drawn By T.M	Date 7/13/2010	

Buried Geothermal Freeze Free Trough



TARANTULA MESA PIPELINE
FROST FREE TROUGH

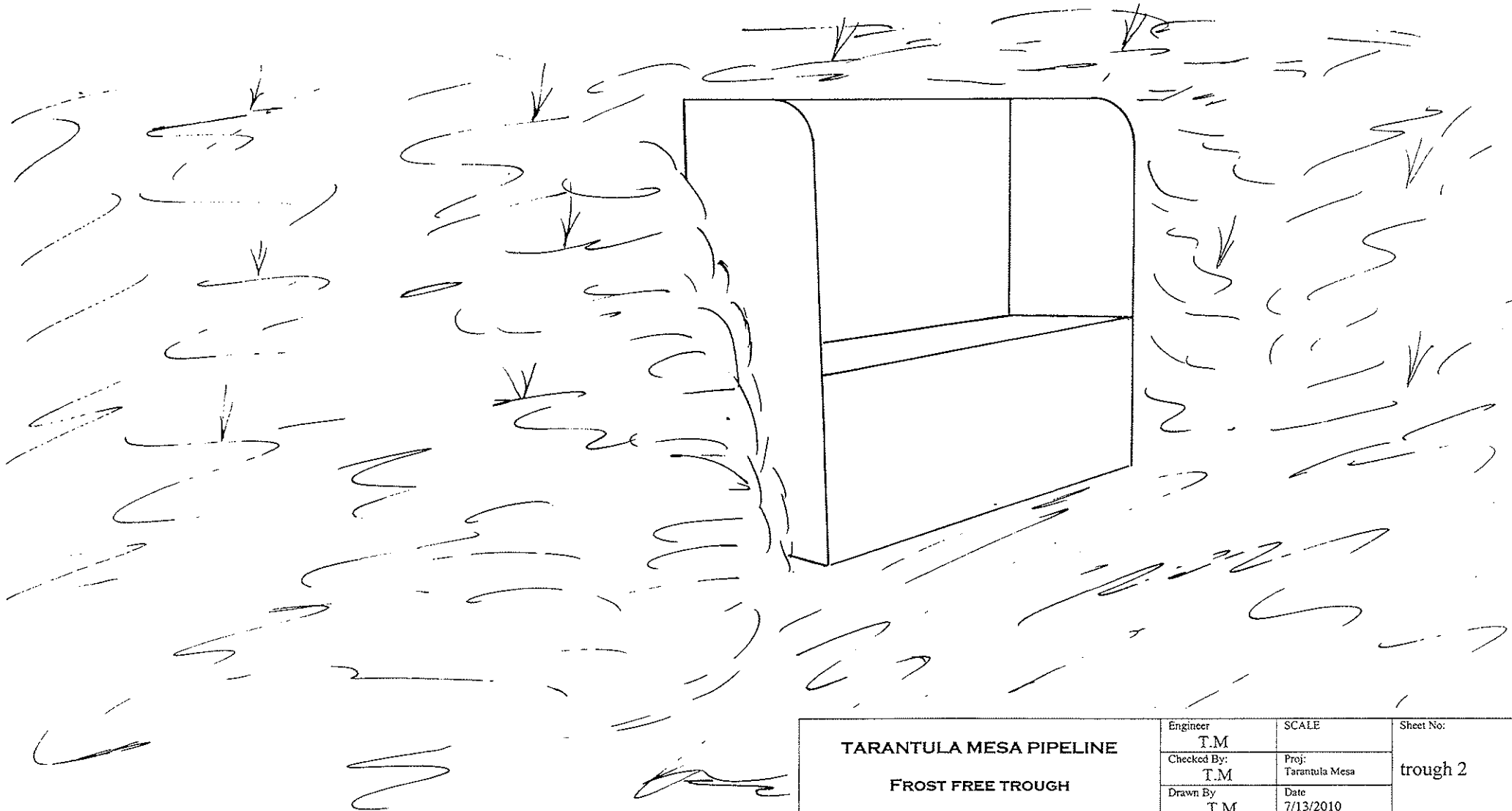
Engineer T.M	SCALE
Checked By: T.M	Proj: Tarantula Mesa
Drawn By T.M	Date 7/13/2010

Sheet No:
 trough 1

ICE FREE LIVESTOCK WATER TROUGH

NOTE: FOR BEST RESULTS FACE TROUGH SOUTH

SHEET 1 OF 3



TARANTULA MESA PIPELINE

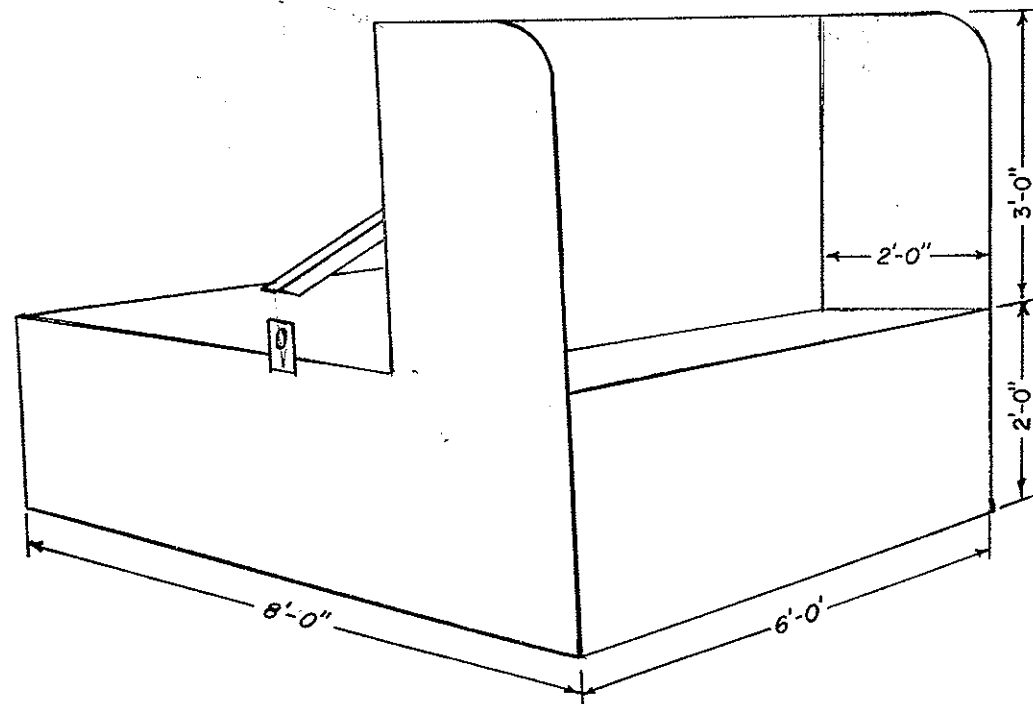
FROST FREE TROUGH

Engineer T.M	SCALE	Sheet No: trough 2
Checked By: T.M	Proj: Tarantula Mesa	
Drawn By T.M	Date 7/13/2010	

ICE FREE LIVESTOCK WATER TROUGH

SHEET 2 OF 3

NOTE: TROUGH IS MADE FROM 3/16" THICK SHEET METAL
TROUGH CAPACITY: 700 GAL.



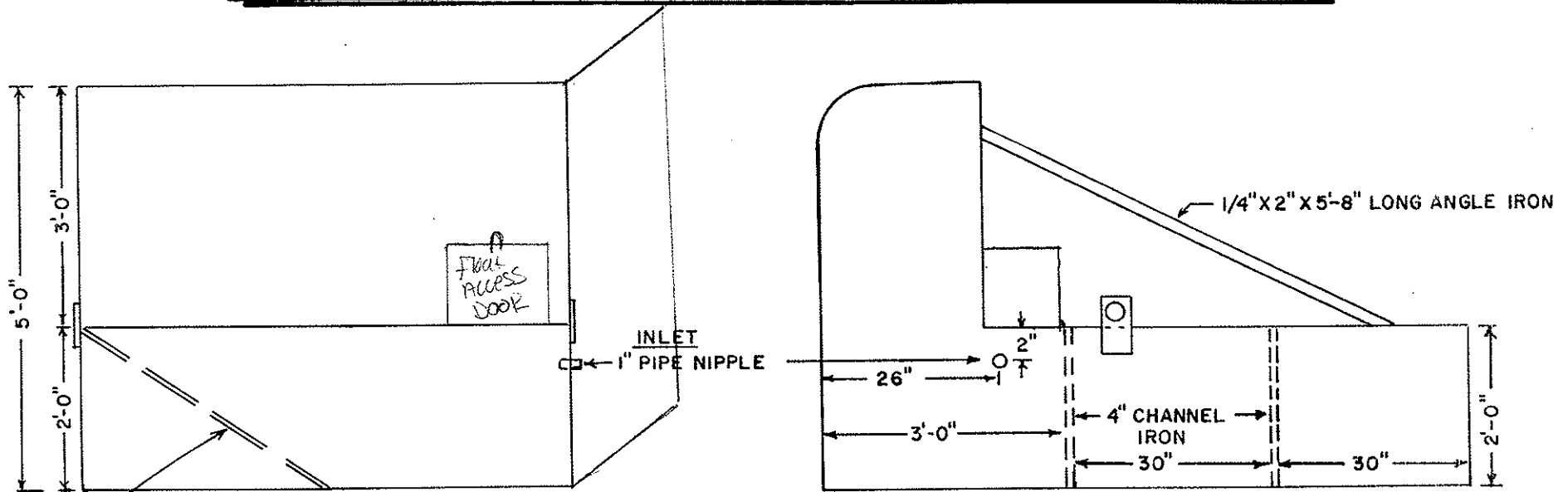
TARANTULA MESA PIPELINE

FROST FREE TROUGH

Engineer T.M.	SCALE	Sheet No: trough 3
Checked By: T.M.	Proj: Tarantula Mesa	
Drawn By T.M.	Date 7/13/2010	

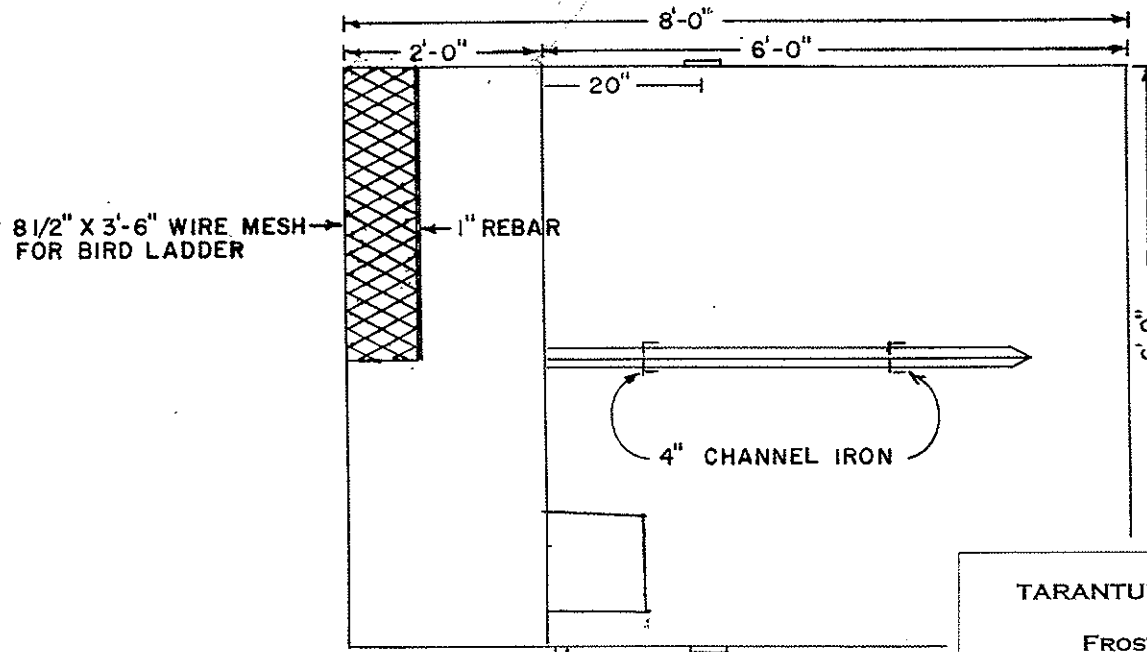
ICE FREE LIVESTOCK WATER TROUGH

SHEET 3 OF 3



FRONT VIEW

SIDE VIEW



TOP VIEW

TARANTULA MESA PIPELINE
FROST FREE TROUGH

Engineer T.M	SCALE	Sheet No:
Checked By: T.M	Proj: Tarantula Mesa	trough 4
Drawn By T.M	Date 7/13/2010	